

What is claimed is:

1. A building unit system comprised of discrete, non-geometric units adapted to be fit together, said units comprising at least first units and second units, both of said first units and said second units having irregularly shaped sides, said second units being of a different size or shape than said first units, both said first units and said second units having sides that mate with other first units and mate with other second units, said units adapted to form a continuous surface or structure without overlap between units or large gaps between units and having a non-repeating pattern appearance.
2. A building unit having a plurality of faces, at least one face comprised of x primary elements, wherein x is an integer equal to or greater than 2, each primary element being a rotational tessellation having
 - a first side extending in a generally radial direction relative to a first vertex, said first side being irregularly shaped;
 - a second side extending in a generally radial direction relative to the first vertex, said second side being substantially a rotational image of said first side and being rotationally spaced from said first side by a first angle of 360 degrees divided by n , where n is an integer greater than or equal to 3;
 - a third side extending in a generally radial direction relative to a second vertex, the second vertex being spaced from the first vertex, and
 - a fourth side extending in a generally radial direction relative to the second vertex and being substantially a rotational image of said third side and rotationally spaced there from by a second angle of 360 degrees divided by m , where m is an integer greater than or equal to 2.
3. A building unit as in claim 2, wherein the first and second angles are not equal.
4. A building unit as in claim 3, wherein the first angle is 60 degrees and the second angle is 180 degrees.
5. A building unit as in claim 3, wherein the first angle is 60 degrees and the second angle is 120 degrees.
6. A building unit as in claim 3, wherein the first angle is 90 degrees and the second angle is 180 degrees.
7. A building unit as in claim 2, comprising at least three of said primary elements, at least two of said elements sharing a common first vertex and at least two of said elements sharing a common second vertex.

8. A building unit as in claim 2, wherein said primary element further comprises a fifth side and a sixth side extending in a generally radial direction relative to a third vertex, said sixth side being substantially a rotational image of said fifth side, said fifth and sixth sides being rotationally spaced by a third angle, and where in the sum of the first, second and third angles is 360 degrees.

9. A tessellated surface covering or structure comprised of units, without substantial gaps or overlap between units, characterized in that

the surface covering or structure has a non-repeating pattern appearance, and

each of said units has at least one face, said at least one face is comprised of x primary elements, where x is an integer equal to or greater than 1, and said primary element is a rotational tessellation comprising

a first side extending in a generally radial direction relative to a first vertex, said first side being irregularly shaped;

a second side extending in a generally radial direction relative to said first vertex and being rotationally spaced from said first side by a first angle of 360 degrees divided by n , where n is an integer greater than or equal to 3, said second side being substantially a rotational image of said first side;

a third side extending in a generally radial direction from a second vertex, said third side being irregularly shaped, said second vertex being spaced apart from said first vertex; and

a fourth side extending in a generally radial direction from said second vertex, said fourth side being substantially a rotational image of said third side, said fourth side being rotationally spaced from said third side by a second angle of 360 degrees divided by m , where m is an integer greater than or equal to 2, said second angle being different from said first angle.

10. A tessellated surface covering or structure as in claim 9 comprising a plurality of first units, each first unit comprised of at least one primary element; and a plurality of second units, each second unit comprised of at least two primary elements.

11. A tessellated surface covering or structure as in claim 10 further comprising a plurality of third units, each said third unit comprised of at least three primary elements.

12. A system of irregular building units, comprising

a multiplicity of first units and a multiplicity of second units adapted to be assembled to form a continuous surface without overlap between units and without large gaps between units, said second units being a different size and shape than said first units;

each said unit having a face comprised of x primary elements, where x is an integer equal to or greater than 1, said first units comprising at least one primary element and said second units comprising at least two primary elements; and

said primary element being a rotational tessellation having

a first side extending in a generally radial direction relative to a first vertex, said first side being irregularly shaped;

a second side extending in a generally radial direction relative to the first vertex, said second side being substantially a rotational image of said first side and being rotationally spaced from said first side by a first angle of 360 degrees divided by n , where n is an integer greater than or equal to 2;

a third side extending in a generally radial direction from a second vertex, said third side being irregularly shaped, said second vertex spaced apart from said first vertex; and

a fourth side extending in a generally radial direction from the second vertex, said fourth side being substantially a rotational image of said third side, said fourth side being rotationally spaced from said third side by a second angle, the sum of the first and second angles being 180, 240, 270 or 300 degrees.

13. A system as in claim 12 comprising a multiplicity of third units, each said third unit formed of at least two primary elements and having a size or shape different from both said first units and said second units.

14. A system as in claim 12 wherein some of said units have surface variations different for other ones of said units.

15. A system as in claim 12, wherein said units bear indicia to facilitate mating units.

16. A building unit, comprising
a least one face having at least a first side and a second side, said sides having an irregular configuration, said sides being substantially rotational images of each other;
plural spacers projecting from each side, and
at least one primary rotational tessellation element defined by said spacers.

17. A building unit as in claim 16 wherein said first side and said second sides do not have identical configurations such that when a first side of one said unit is mated

with a second side of another said unit a gap having a variable width is formed between the units.

18. A three dimensional structural unit, comprising
at least one face comprising a rotational tessellation;

5 said at least one face having at least two irregular sides extending there from;
and

at least one of said sides having connectors adapted to align adjacent units.

19. A structural unit as in claim 18, said rotational tessellation comprising
a primary element having

10 a first side extending in a generally radial direction relative to a first
vertex, said first side being irregularly shaped;

a second side extending in a generally radial direction relative to the
first vertex, said second side being substantially a rotational image of said first side and being
rotationally spaced from said first side by a first angle of 360 degrees divided by n , where n is
15 an integer greater than or equal to 2;

a third side extending in a generally radial direction from a second
vertex, said third side being irregularly shaped, said second vertex spaced apart from said first
vertex; and

20 a fourth side extending in a generally radial direction from the second
vertex, said fourth side being substantially a rotational image of said third side, said fourth
side being rotationally spaced from said third side by a second angle, the sum of the first and
second angles being 180, 240, 270 or 300 degrees.

20. A surface or structure comprised of building units adapted to be fit
together, characterized in that said units comprise at least first units and second units; said
25 first units comprising at least one face having at least some irregularly shaped sides, said first
unit face comprising at least one primary tessellation element; said second units comprising
at least one face having at least some irregularly shaped sides, said second unit face
comprising at least two primary tessellation elements, and said second units being of a
different size or shape than said first units; both said first units and said second units having
30 sides that mate with other first units and mate with other second units; and said surface or
structure being continuous without overlap between units or large gaps between units, and
said surface or structure having a non-repeating pattern appearance.